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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,160	10/31/2001	Clarence Y.F. Chow	11698US03	5800

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EXAMINER

KALAFUT, STEPHEN J

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 07/07/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

10/003,160

Applicant(s)

CHOW ET AL.

Examiner

Stephen J. Kalafut

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10/31/01.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claim 9 is rejected under 35 U.S.C. 102(a) and (e) as being anticipated by Kawatsu (US 5,677,073).

Kawatsu discloses a fuel cell with a polymer electrolyte (column 5, lines 50-53), which is rendered free of poisons such as CO by a poisoning cancellation means, including reforming suppression means to forcibly lower the concentration of CO, and means to reverse the direction of the flow of fuel gas (column 3, lines 48-60). Thus, the operating method would produce the reversal of flow of a substantially poison-free fuel stream. Since the reaction of the fuel gas produces water, this flow reversal would also to some extent distribute water in the fuel cell.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawatsu (US 5,677,073) in view of Kothmann (US 4,582,765).

Kawatsu does not disclose the reversal of coolant flow. Kothmann discloses a system for reversing the coolant flow within a fuel cell stack, which makes the thermal profile more uniform (column 2, lines 55-63), which minimizes pressure drops and circulatory power requirements (column 2, lines 27-62). To obtain this benefit for the fuel cell of Kawatsu, it would be obvious to reverse the flow of coolant therein, as taught by Kothmann.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strasser (US 5,543,238) in view of Doyle (US 3,553,023) and Kothmann (US 4,582,765).

Strasser discloses a fuel cell (2) including an ion exchange membrane (14), a cathode (12), a cathode flow field (8) which directs air between an inlet (26) and an outlet (28), an anode (16), an anode flow field (20) which directs fuel between an inlet (42) and an outlet (50), and passages (4, 24) for coolant flow. Strasser teaches that a polymer electrolyte must be moistened (column 2, lines 38-49), and that product water must be carried off. The operability of polymer electrolyte fuel cells depends greatly on the water balance (column 1, lines 47-61). Strasser does not disclose flow reversing means for the flow direction of oxidant or coolant. Doyle discloses a

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system for periodical reversing the direction of flow of at least one reactant gas (column 4, lines 8-12), and shows this mainly for the oxidant stream, in figures 1 and 2. This prevents dry-out of a fuel cell, as well as an uneven distribution of water therein (column 2, lines 37-45). Because the more evenly distributed water content is also desired by Strasser, it would be obvious to reverse the flow of oxidant in the fuel cell of Strasser, as taught by Doyle. Kothmann discloses a system for reversing the coolant flow within a fuel cell stack, which makes the thermal profile more uniform (column 2, lines 55-63), which minimizes pressure drops and circulatory power requirements (column 2, lines 27-62). To obtain this benefit for the fuel cell of Strasser, it would be obvious to reverse the flow of coolant therein, as taught by Kothmann. Regarding claims 11 and 12, since the exothermic fuel cell reaction takes place along the oxidant flow path, its temperature would gradually increase starting at its entrance into the cell. Regarding claim 14, since the coolant channels (44) and oxidant channels (28) of Kothmann are parallel, the flow reversal would result in concurrent flow, at least during part of the fuel cell operation.

Kothmann also discloses a controller (60) for the flow reversal operation.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2 and 4-7 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3, 4, 7, and 9 of U.S. Patent No. 5,935,726 in view of Gorbell *et al.* (US 5,486,430).

Present claims 1 and 7 differ from patent claims 1 and 9, respectively, by reciting an array of a plurality of fuel cell stacks. The patented claims recite a fuel cell, which may be encompass only a single cell. Gorbell *et al.* disclose an array of five fuel cell stacks (column 4, lines 33-36), and teach that to increase the overall power output, two or more fuel cells can be connected together to form a stack, and that two or more stacks may be connected together to form an array (column 1, line 61 through column 2, line 19). Thus, to obtain a larger power output, it would be obvious to connect fuel cells of the type claimed in Patent No. 5,935,726 into a stack, and such stacks into an array, as taught by Gorbell *et al.* Present claims 4, 5, and 6 repeat the same details as patented claims 3, 4 and 7, respectively. Regarding present claim 2, since the exothermic fuel cell reaction takes place along the oxidant flow path, its temperature would gradually increase starting at its entrance into the cell.

Claims 3 and 8 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 9 of U.S. Patent No. 5,935,726 in view of Gorbell *et al.*, as applied to claims 1 and 7 above, and further in view of Kothmann.

The combination of patented claims 1 and 9 with Gorbell *et al.* does not provide for the reversal of coolant flow. Kothmann discloses a system for reversing the coolant flow within a fuel cell stack, which makes the thermal profile more uniform (column 2, lines 55-63), which minimizes pressure drops and circulatory power requirements (column 2, lines 27-62). To obtain

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this benefit for the fuel cell claimed in Patent No. 5,935,726, it would be obvious to reverse the flow of coolant therein, as taught by Kothmann.

Applicant's arguments with respect to claims 1-14 in their preliminary remarks have been considered but are moot in view of the new ground(s) of rejection.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chow *et al.* (US 6322914) is the parent of the present application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Kalafut whose telephone number is (703) 308-0433. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

sjk  
June 22, 2003



STEPHEN J. KALAFUT  
PRIMARY EXAMINER  
GROUP

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